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greatly delayed. Until tracks fit for a horse to travel in have been cut through the bush, it will not be possible to open up this district, which in parts teems with mineral wealth. The excessive rainfall — which, however, has never been measured — makes life in that district rather miserable; while the hordes of bloodthirsty sandflies, which occur everywhere in the open country, tend at times to make it unendurable. G. M. T.

Dunedin, N.Z., April 20.

HEALTH MATTERS.

Ladies' health protective association.

THE Ladies' health protective association of New York, which was incorporated in 1884, has published its report for the years 1885 and 1886. The particular business and object of this society are stated in the certificate of incorporation to be the protection of the health of the people of the city of New York by taking such action from time to time as may secure the enforcement of existing sanitary laws and regulations, by calling the attention of the proper authorities to any violations thereof, and to procure the amendment of said laws and regulations when they shall be found inefficient for the prevention of acts injurious to the public health. Any lady residing in the city may become a member of the association, and any gentleman may be admitted as an advisory member. One of the first nuisances attacked by the association was the manure-yard of Michael Kane at the foot of East 46th Street, in which large quantities of stable-manure were accumulated. Kane had been indicted four years before, but the nuisance still continued. Another complaint was made to the grand jury, and three ladies of the association were summoned before that body to testify. He was again indicted, and subsequently tried and convicted, and the manure entirely removed. During one of the visits of a committee, its members were attacked by a mob, which necessitated police escort in their future investigations. The attention of the association was next directed to the slaughter-houses of the city. In the annual report it is stated that three interviews were had with the board of health to obtain the co-operation of that body in an effort to remove the slaughter-houses from the city limits, or else to compel them to conform to proper sanitary regulations. Meeting with no encouragement, a bill was prepared and submitted to the legislature, providing for better regulations for the slaughter-houses. A public meeting was held to sustain this movement, at which Hon. Noah Davis, chief justice of the supreme court, presided. The bill did not pass the legislature,

but the efforts put forth by the association aroused the public attention and interest. In the following year the nuisance from accumulated manure again demanded interference. A bill was presented to the legislature, establishing a permanent dumping-ground between 95th and 97th streets and 1st Avenue and East River. Through the efforts of this association, the measure was defeated. The report states that the removal of stable-refuse, and its transportation through the city, are still subjects of annoyance and complaint, and that the ordinances limiting the hours and the manner of removal are continually disregarded. Efforts are being made to persuade railroad companies and others to bale the manure, and thus diminish the nuisance. The association has been informed by one of the large slaughterers of the city that he will build an *abattoir* which will be a model in every respect, and this is looked forward to as one method of lessening the nuisances connected with this business. The gas-works, and a section of the city known as 'Little Italy' between 5th and Madison avenues, east of Central park, have also engaged the attention of the members of the association. Examinations have also been made of numerous tenement-houses and schools. The association has demonstrated that a few determined persons, actuated by the public good, can accomplish a great deal in the way of reform, and we wish the association success in its work.

TYPHOID BACILLUS. — Dr. Sternberg has recently conducted some experiments as to the thermal death-point of the bacillus of typhoid-fever. A fresh culture of the organism was introduced into capillary glass tubes, which, after being hermetically sealed, were placed in a vessel containing water, and exposed to a constant temperature for ten minutes. At the end of this time the contents of these tubes are introduced into sterile flesh-peptone-gelatine contained in test-tubes. These are in turn placed in an incubating-oven, and exposed to a temperature of 20° to 22° C. If at the end of a week the organism has not developed, it may be taken for granted that it has been destroyed by the heat. After eight experiments of this kind, it was found that in no instance did the bacillus develop after it had been exposed to a temperature of 56° C., while in one experiment growth occurred after exposure to 55°. The thermal death-point of this bacillus may be safely placed at 56° C. (132.8° F.).

YELLOW-FEVER INOCULATION. — In 1885 and 1886, 6,524 persons submitted themselves to protective vaccination against yellow-fever in Rio

Janeiro. During these two years, 1,675 persons died from that disease; and of that number, 1,667 were unvaccinated, eight only of those who had received the treatment having died. This statement was made by Freire and others to the Academy of science. These gentlemen state, that, taking as the basis of their calculation the population exposed to the contagion, the percentage of deaths for the whole number was one per cent, whereas for those who had been subjected to preventive inoculations it was only one per thousand.

A THREE-YEAR TRANCE. — In the *Revue d'hypnotisme* is reported the case of a young lady who has been in an uninterrupted trance for nearly four years. In 1883 she received a fright, and shortly after had convulsions, from which she passed into a profound sleep which has continued to the present time. She takes food in small quantities. Dr. Bérillon, who reports the case, has, as the result of his examination, found the limbs wasted, and the fat of the body to have disappeared. Anaesthesia is complete. The pulse is very weak, and beats one hundred to the minute. The face is pale, waxy, and expressionless. She is totally unconscious, and cannot be aroused.

PURIFICATION OF SEWAGE. — L. P. Kinnicutt, professor of applied chemistry at the Worcester free institute, has recently given his opinion as to purification of the sewage of that city by means of chemical precipitation. In his report to the city engineer, he discusses the three general methods used for the purification of sewage, — irrigation, intermittent filtration, and chemical precipitation. That sewage can be purified in England by the system of broad irrigation, when the system is carefully carried out, there is no question. The amount of land required, however, is very great, probably an acre for every fifty persons. This, together with the cost of properly preparing the land, conducting the sewage thereto, and carrying the effluent away, makes the system a most costly one for a city of any size. Purification of sewage by means of intermittent filtration is an attempt to reduce the amount of land by applying the sewage intermittently, the amount of land being, as given by the most careful authorities, one acre to five hundred persons. The cost of preparing the land for this purpose is very great, as it must be deeply under-drained. The land, when used, is not well fitted for the production of crops, and the decomposition of the organic matter contained in the sewage depends almost entirely on the oxygen contained in the soil. The third method, chemical precipitation, consists in adding certain chemicals to the sewage, which precipitates practically all the suspended

matter, and which could undoubtedly be carried to a point where most of the offensive matter in solution was destroyed. The effluent obtained by this process can either be carried directly into a running stream, or first filtered through a small area of land. The recommendation of Professor Kinnicutt in reference to the best method for the purification of the sewage of Worcester is that chemical precipitation be adopted, with the addition of a small area of land, for possible use in very hot, dry weather; and, for every million gallons of sewage, the addition of about 900 pounds of quicklime for the neutralization of free acid, and 2,150 pounds in the form of milk of lime, or 1,000 pounds in the form of lime-water, for the precipitation process proper.

EXPLORATION AND TRAVEL.

Africa.

THE journal of Bishop Hannington, who was murdered in Uganda, contains some interesting notes on Masai Land, according to *Petermann's Mittheilungen* for May. His travels between the Victoria Nyanza and the Nile are important, as he was the first white man to visit that part of the country.

Count Teleki has organized an expedition to Central Africa, which left Zanzibar on Jan. 24, under the command of Lieutenant von Höhnel. The object of the expedition is the exploration of the Kilima Njaro.

Extracts from letters of H. M. Stanley, dated from the Kongo on March 20 and 21, are published in the *London Times*. The expedition arrived at Banana Point on March 18, after a pleasant and satisfactory voyage. Stanley chartered three small steamers belonging to the trading companies of the lower Kongo, and on March 20 and 21 the whole expedition was conveyed to Matadi. The expedition appears to be in a very satisfactory condition. A serious disturbance between the Zanzibari and Tippu-Tip's men on the one side, and the Sudanese on the other, was quickly suppressed; and Stanley says that later on perfect peace prevailed among the different elements composing the expedition. The news he received at Bomo from the committee in charge of the administration of the Kongo Free State was very discouraging. He was informed that a serious famine existed as far as Stanley Pool, and that the steamer Stanley is at present hauled up for repairs. Besides this, the Baptist mission refused to lend its steamer Peace to the expedition. Thus Stanley encounters numerous obstacles; but we may expect, nevertheless, to hear soon of his arrival at Stanley Pool.